

energy of the neighboring films and the short side, a_p , of the ~~other~~ rectangular unit cells that constitute the plane with minimum free energy of the conductor film, and is represented as $\{ |a_p - a_n|/a_p \} \times 100 = A (\%)$, and B indicates the difference between the long side, b_n , of the rectangular unit cells that constitute the plane with minimum free energy of the neighboring films and the long side, b_p , of the rectangular unit cells that constitute the plane with minimum free energy of the conductor film, and is represented as $\{ |b_p - b_n|/b_p \} \times 100 = B (\%)$. This is for the purpose of retarding the diffusion of the conductor film so as to prevent voids that may be caused by so-called electromigration.

B' Concretely, for example, where the conductor film 117 is a copper (Cu) film, the neighboring films 116a, 116b could be any one selected from the group consisting of a rhodium (Rh) film, a ruthenium (Ru) film, an iridium (Ir) film, an osmium (Os) film and a platinum (Pt) film. Since the conductor films 115, 120 for the plugs are adjacent to the conductor film 117, they could be considered as the neighboring films to the conductor film 117. Therefore, where the conductor film 117 is a copper (Cu) film the plugs 115, 120 could be any one selected from the group consisting of a rhodium (Rh) film, a ruthenium (Ru) film, and iridium (Ir) film, an osmium (Os) film and a platinum (Pt) film, by which the diffusion of the conductor film 117 is retarded to prevent voids that may be caused by so-called electromigration. In that constitution, since the rhodium (Rh) film, the ruthenium (Ru) film, the iridium (Ir) film, the osmium (Os) film and the platinum (Pt) film for the plug all have a higher melting point than a copper (Cu) film, the plug could exhibit an additional effect of such that its resistance against heat is higher than that of plugs of conductor films 115, 120 of being copper (Cu) films. In this case, it is desirable that the neighboring films, 114a, 114b, 119a, 119b to be adjacent to the conductor films

115, 120 are titanium nitride (TiN) films, as exhibiting good adhesiveness to the insulating films 113, 121. If the adhesiveness between them could be neglected, the neighboring films 114a, 114b, 119a, 119b may be omitted. Where the low level of electric resistance of the plug is regarded as more important than the resistance thereof against heat, a copper (Cu) film is used for the conductor films 115, 120 for the plug, and any one selected from the group consisting of a rhodium (Rh) film, a ruthenium (Ru) film, an iridium (Ir) film, an osmium (Os) film and a platinum (Pt) film is used for the neighboring films 114a, 114b, 119a, 119b adjacent to the conductor films 115, 120. Though not shown in Fig. 8, any one or more additional layers may be formed between each of the neighboring films 116a, 116b, 122a, 122b, 114a, 114b, 119a, 119b and the insulating film adjacent thereto, as in Fig. 7.--

Please delete the paragraph from page 25, line 24 to page 27, line 18, and substitute therefor the following new paragraph:

--Fig. 9 is referred to, which shows one preferred functional structure of the semiconductor device of the third embodiment. The structural difference between Fig. 9 and Fig. 8 is that, in Fig. 9, a neighboring film 126a is formed between the neighboring film 116a and the insulating film 113, a neighboring film 126b is formed between the neighboring film 116b and the insulating film 121, a neighboring film 127a is formed between the neighboring film 122a and the insulating film 121, and a neighboring film 127b is formed between the neighboring film 122b and the insulating film 125. The conductor films 117, 123 to be interconnects are copper (Cu) films having a low electric

resistance, in order that the device could have good capabilities for rapid operation. In order to make the copper (Cu) film interconnects have good electromigration resistance, the neighboring films 116a, 116b, 122a, 122b of diffusion barriers for the copper (Cu) films 117, 123 are ruthenium (Ru) films. The plugs 115, 120 adjacent to the copper (Cu) films 117, 123 are ruthenium (Ru) films so as to have good electromigration resistance. Electromigration resistance is especially important near plugs, for example, as in "Materials Reliability in Microelectronics", pp. 81-86 in Vol. 428 of *Symposium Proceedings of the Materials Research Society (MRS)*. The ruthenium (Ru) plugs have the advantage of good resistance against heat. In that constitution, the plug 115 and the diffusion barrier 116a are both ruthenium (Ru) films, and it is desirable to form these films both at a time as facilitating the film formation. Like those, the plug 120 and the diffusion barrier 127a are also both ruthenium (Ru) films, and it is desirable to form these films both at a time as facilitating the film formation. In order to enhance the adhesiveness between the ruthenium (Ru) films and the insulating films adjacent thereto, the diffusion barriers 126a, 126b, 127a, 127b, 114a, 114b, 119a, 119b all are of a titanium nitride (TiN) film. In that constitution, the diffusion barriers 114a, 114b and the diffusion barrier 126a are all titanium nitride (TiN) films, and it is desirable to form these films all at a time as facilitating the film formation. Like those, the diffusion barriers 119a, 119b and the diffusion barrier 127a are all titanium nitride (TiN) films, and it is desirable to form these films all at a time as facilitating the film formation. Of those, at least one of the copper films and the diffusion barriers is formed at least through sputtering. It is more desirable that a film with low contact resistance, such as a metal

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